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THE TROPIDUCHIDAE OF THE LESSER ANTILLES (Homoptera: Fulgoroidea)

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In 1881 Lethierry described two tropiduchid species (*triangulator* and *longiceps*) collected by M. Delauney in Guadeloupe, and referred them to the genus *Alcestis* Stål; his descriptions, however, leave no doubt that he was dealing with species belonging to two genera of the tribe Tambiniini. In 1895 Uhler, dealing with the Homoptera collected in St. Vincent by H. H. Smith, described the genus *Tangidia* with a new species, *alternata*, as the monotype, and two other new species, *angustata* and *emarginata*, which he placed in *Tangia* Stål and *Dictyophara* Germar respectively. Nineteen years later Melichar recognised the generic distinctness of *Tangia angustata* Uhler and in his monograph of the Tropiduchidae made this species the genotype of his new genus *Neotangia*, which was distinguished principally by its rather short rounded vertex, on which the median carina was forked in the basal half, by the absence of cross-veins along the costal margin, and by the tegminal veins Sc+R and M reaching the transverse nodal line before forking. Melichar did not include *Dictyophara emarginata* Uhl. in his monograph of the Tropiduchidae or in that of the Dictyopharidae. In 1931 Muir, after examining the material in the British Museum, placed this species in *Neotangia* Mel., considering it to be typical of the genus, and described a new species, *uhleri*, from Grenada, B.W.I., which he referred to *Tangidia* Uhl., though apparently with some hesitation, as he added the note "I doubt if *Neotangia* Melichar, will be able to stand apart from *Tangidia*." (1931 Ann. Mag. Nat. Hist. 10(7): 306).

Such is the history of the species described from the Lesser Antilles. In the present paper reference is made to tambiniine genera known only from the Greater Antilles, these being *Remosa* Distant, *Neurotmeta* Guerin-Meneville, and *Cyphoceratops* Uhler, the second of which has Lesser Antillean representatives. *Remosa* was erected by Distant in 1906 to receive *Dictyophora cultellator* Walker from Santo Domingo, and in the following year Van Duzee considered that some specimens

taken by him in Jamaica belonged to Walker's species, and he listed them as such under the combination *Tangia cultellator* (Wlk.). In the writer's collection there are several specimens of *Remosa* taken in the same locality which agree with Van Duzee's brief notes; these are close to *R. cultellator* (Wlk.) but not conspecific, and are placed below in a new species. The type of *Neurotmeta* Guerin-Meneville was fixed by Myers (1928) as *sponsa* Guerin-Meneville, and Metcalf and Bruner (1930) considered that *Monopsis viridis* Wlk. from St. Thomas, Virgin Is., belongs to *Neurotmeta*. The writer provisionally accepts this view, pending a detailed comparison of *viridis* Wlk. with the genotype, and assigns to *Neurotmeta* four new species described below.

The material on which the present study is based comprises the writer's collection of some two hundred specimens of West Indian Tropiduchidae, together with a number of species from this area in the collections of the Museum of Comparative Zoology, the American Museum of Natural History and the United States National Museum. Types or authoritative genotype material of almost all the genera discussed have been seen. It is perhaps worth recording that no specimen agreeing accurately with the figures of *Monopsis tabida* Spinola has been seen, and the writer is inclined to question whether a valid distinction can be drawn between *Monopsis* and *Neurotmeta*.

In order to avoid confusion later it has been considered advisable to include the description of a new genus (*Aripoa*) from Trinidad, so that its position with regard to the *Neotangia* complex of the Lesser Antilles can be clearly indicated; the present opportunity has been taken to present a description of a new species of *Alcestis* Stål (*sensu lato*) from the same island.

The writer is greatly indebted to Mr. W. E. China for comparing material with types in his charge, and for making three drawings from type specimens which have been incorporated in the plates. Types of species described in this paper have been placed in the U. S. National Museum.

The separation of the genera *Remosa*, *Roesma* and *Neurotmeta* from each other and from the remainder presents no difficulty, but in the case of *Neotangia* and *Tangidia*, the new Lesser Antillean genera *Dictyotangia* and *Dioxyomus*, and the new Trinidadian genus *Aripoa*, all of which in existing classifications would fall into *Tangidia* or *Neotangia*, it has proved necessary to seek new characters for generic separation. Such characters have been found, and among them the most fundamental appear to be the shape of the peri-opercular ornamentation on the egg and the general pattern of the aedeagal armature; other excellent characters are provided by the proportions of the vertex, the shape of its lateral margins and median carina, the presence or absence of a thick callus along its anterior margin,

the shape of the pronotum, the distinctness of the submarginal pronotal carinae, the flatness or concavity of the lateral intercarinal surfaces of the pronotum, the proportions of the tegmina, the position of the fork of Sc+R, the proportionate distance of the nodal line of cross-veins from the base, the relative widths of the costal area, costal and radial cells, the typical number of apical areoles, the number of "rows" (traceable rank-groupings) of cross-veins in the membrane, the straightness or obliquity of the sutural margin distad of the claval apex, the typical form of wing venation (which is subject to minor variation within species), the number of teeth on the third valvulae of the ovipositor, the shape of the dorsal margin of the genital styles of the male, the relative body size and the colour. It is a matter for satisfaction that the genera separated on the basis of all the above characters are very distinct; for the systematist it is hardly less satisfying that the genera can conveniently be separated merely by reference to a few obvious characters, as indicated in the key given below.

The opercular structures of the egg differ in form between genera, while differences in details offer in some genera a very reliable, though rather inconvenient, means of separating true species. The operculum is a slightly domed cap, on which rows of minute cells make a reticulate lattice-like pattern, and is provided anteriorly with a chorionic process apparently traversed by a fine canal. This process in its simplest form, as in *Aripoa* (described below), is short and tubular, and slightly dilated at the apex. From this condition one line of advance consists in elongation of the tube, as found in *Tangidia*, *Neurotmeta* and *Dioxyomus* (described below), culminating, as far as present knowledge extends, in the structure found in *Dictyotangia* (described below). Alternatively the elongation of the chorionic process may be accompanied by extensive lateral dilation, with the result that the structure assumes the form of a foliate lamina, which is more or less reticulate and, throguh incurving of the edges, somewhat scoop-shaped in profile; a process of this type may be dilated only in its lower part, as in *Chasmacephala* (described below) or, as in *Neotangia* and *Remosa*, along its entire length. The lumen of the canal in the chorionic process does not become expanded, and in most cases the tubular walls of the process can be observed traversing the lamina. It would seem that in this type of ornamentation a portion of the margin of the operculum has been drawn up with the elongating chorionic process, as is suggested by the condition found in the proximal half of the process of *Dictyotangia*, or has itself undergone elongation and has carried the stoma of the chorionic aperture forward on its anterior margin, finally producing the condition seen in *Remosa* and *Neotangia*. In addition to the above ornamentation, which is developed on the

margin of the operculum, and is detachable with it, a chitinous rim or collar may be developed on the egg-wall around the edge of the operculum. This peri-opercular rim may be insignificant (*Aripoa*), or anteriorly somewhat raised, but posteriorly represented by little more than a slight thickening (*Tangidia*, *Neurotmeta*, *Chasmacephala*), or more or less raised anteriorly and posteriorly (*Dioxyomus*), or prominently raised all round (*Neotangia*, *Remosa*). The peri-opercular rim of *Dictyotangia* is of the second type, but the anterior margin is prolonged to an exceptional degree.

The distribution of the species discussed shows that each island of the Lesser Antillean archipelago has a single endemic species of each of the genera that are present. The genus *Remosa*, known from the Greater Antilles (Cuba, Jamaica, Haiti), does not occur in the Windward and Leeward Islands; *Neurotmeta*, found in the Greater Antilles and in the Virgin Islands, is also apparently represented in all islands at least as far south as Dominica; *Neotangia* has not yet been found north of Dominica, and occurs in all islands to the south where search has been made as far as Grenada, while on present evidence it must be presumed that *Tangidia* and *Dioxyomus* have a closely similar distribution; *Dictyotang a*, the haplotype of which is a comparatively common insect in St. Vincent, has been found nowhere else. The case of *Cyphoceratops*, *Parahydriena* and *Chasmacephala*, is of considerable interest: it would seem that an old genus, characterised by an elongate sunken vertex and a cixiid-like pronotum, and occupying an isolated position in the tribe to which it belongs, divided into three forms by bizarre development of the vertex: of these *Cyphoceratops* is now found in Cuba and Haiti, *Parahydriena* in Santo Domingo and Puerto Rico, and *Chasmacephala* in the Windward Islands. The last of these broke up into island races which in course of time attained such a high degree of morphological differentiation, pervading male and female genital structures as well as those of the egg, that they must now be considered to be reproductively isolated. The writer has not had opportunity of comparing in a similar manner material of *Parahydriena* and *Cyphoceratops* from different islands, but a specimen of the former from Santo Domingo differed from the Puerto Rican type in the size of the crest on the vertex, suggesting that further differences of a more fundamental nature may exist. Until a close comparison can be made of the genital and egg structures of these two genera the writer feels constrained to recognise their present status, and to consider them, along with *Chasmacephala*, as members of a supergenus, though it is probable that fuller study will show that they would be more properly ranked as subgenera.

It was not without reluctance that the writer reached the con-

clusion that the series of mutually representative species that comprise most of the Antillean genera discussed below cannot each be regarded as a single polytypic species. It is from such a species that each of the existing series has undoubtedly arisen, as the differences between their component members are of equal magnitude, and there is no evidence of successive invasions from any mainland source. The differences which now separate the endemic species are of the same type and magnitude as those used to separate species in the remainder of the Homoptera, and include characters of the vertex (*Remosa*), pygofer, genital styles, anal segment in both sexes, shape of the periandrium, armature of the penis and periandrium, first valvulae of the ovipositor, and the complex architecture of the opercular end of the egg. No intergradation has been found between any two members of a series in the characters employed for its subdivision. Direct proof of the reproductive isolation of each species is lacking; the writer's belief that such isolation exists rests on the facts that the observed specific differences almost entirely occur in structures connected with reproduction and pre-nymphal growth, and are of equal magnitude to those found between species of other families of Fulgoroidea in the same islands for which clear-cut evidence of reproductive isolation is abundantly available.

Terms used in the descriptions are conventional and do not necessarily imply homology with similarly named structures in other orders: the names "penis" and "periandrium" are applied respectively to the soft, membranous, protractile, frequently spinigerous distal portion of the aedeagus and the tough, vitreous, sclerotised, immobile sheath which forms the basal part of the aedeagus.

In addition to the generic key to New-World Tambiniini, a synopsis is given below of the principal characters of the four genera most difficult to separate.

A Summary of the Principal Characters of Aripoa g. n., Neotangia Mel. Tangidia Uhl. and Dioxyomus g. n.

	Aripoa	*Neotangia*	*Tangidia*	*Dioxyomus*
Shape of median carina on vertex.	⅄	⅄	∧	∧
Sides of vertex before eyes.	scarcely curved	incurved	straight, incurved apically	straight
Vertex: width to median length.	1.1 : 1	1.25 : 1	1.6 : 1	1.6 : 1
Lateral margins of frons meeting lateral margins of vertex.	no	yes	no	no
A thick callus on anterior margin of vertex.	yes	no	yes	yes

Sub-marginal carinae of pronotum.	distinct	distinct	absent	very prominent
Lateral and mesal margins of pronotal lateral obes.	converging posteriorly	subparallel	subparallel	subparallel
Lateral pronotal lobes: length to width.	2 : 1	11 : 8	2 : 1	2 : 1
Ventral margin of lateral pronotal lobes.	rounded	obliquely truncate	rounded	rounded-truncate
Tegmen: length to width				
Proportionate distance of nodal line from base.	2.7:1 5/9	3:1 2/3	2.9:1 3/5	2.8:1 7/11
Number of apical areoles	17	14	13–15	15
Number of irregular rows of cross-veins.	6	6–8	3	5
Sutural margin distad of clavus.	straight	oblique	slightly oblique	almost straight
Wing: average number of branches of Culb.	3	3	2	4
Number of teeth on third valvulae.	9	9	9	10
Egg: peri-opercular collar.	absent	well developed	not prominent, though raised anteriorly	distinct
Egg: chorionic process.	tubular	laminate	tubular	tubular
Approximate length, vertex to apex of tegmina.	7.2 mm.	7.0 mm.	6.3 mm.	8.6
Colour.	green	green	tawny, marked with brown	green

Subfamily TAMBINIINAE

Tribe ALCESTINI

ALCESTIS Stål

Stål 1862 K. Svenska Vet. Akad. Handl. 3 (6): 11. Genotype, *A. pallescens* Stål ibid.

Vertex broader than long in middle, lateral margins parallel, apex rounded, posterior margin shallowly excavate, median carina usually present, sometimes obsolete; frons longer than broad (about 1.5:1), usually medially carinate, carina sometimes anchor-like near suture, lateral margins subparallel basally, somewhat arcuate distally; clypeus rather small, lateral margins not carinate, antennae short. Pronotum as long as vertex, tricarinate, lateral carinae diverging posteriorly, anterior margin arcuately convex, posterior margin excavate, sometimes with a median notch; mesonotum broader than long, tricarinate, lateral carinae arcuate, joined to median carina anteriorly. Tegmina broad, costal margin strongly curved, sutural margin straight, a prominent cell present

at base anterior to Sc+R, subcosta and sometimes costa giving off several branches, often distally bifurcate, to margin. Post-tibiae with 3 spines.

Alcestis lunata, new species

(Figs. 21–23)

Female. Length, 6.3 mm.; tegmen, 8.0 mm; length with tegmina 9.3 mm.

Vertex twice as broad as long, flattened, lateral margins straight, anterior margin shallowly convex, posterior margin shallowly excavate, median carina obsolete; frons longer than broad (1.5:1), median carina broad.

Tegmina longer than broad (2.3:1), costa remote from margin strongly arcuate giving off 4 veins to anterior margin, the basal 2 veins simple, the distal vein forked, Sc giving off 7 branches to margin, basal costal cell 3.5 times longer than broad, R with 2 branches at margin, M with 5, Cu1a with 5, Cu1b with 3; Sc + R forking near basal quarter, M forking near middle of tegmen, Cu1 forking rather more basad than M, about level with injunction of calval veins. Wings with R, M, Cu1a and Cu1b forked once before apex, Cu2 simple, the first two veins united to apical quarter.

Pale green; tegmina hyaline, veins pallid green, cross veins of the sam colour, wings hyaline.

Ovipositor with third valvulae armed with 8 spines on apical margin.

Described from one female collected by the writer in Caura Valley, Northern Range, Trinidad, B.W.I. (March 10, 1936) on forest undergrowth. This species is close to *melichari* Schmidt from which it differs in the shape of the basal cell and in its larger size.

Tribe TAMBINIINI

KEY TO THE NEW WORLD GENERA OF THE TRIBE TAMBINIINI

(1) (2) Vertex with a cephalic process at least as long as pro- and mesonotum.....(19)
(2) (1) Vertex produced before eyes but not forming a large cephalic process.....(3)
(3) (4) Tegmina with one or no transverse line distad of nodal line.....(3)
(4) (3) Tegmina with numerous cross veins distally in irregular series....(5)
(5) (6) Vertex with median carina simple, unbranched.....(7)
(6) (5) Vertex with median carina ∧- or ⋋- shaped .....(11)
(7) (8) Frons ecarinate, sides of vertex parallel.....*Pelitropis* Van Duzee
(8) (7) Frons medially carinate, sides of vertex converging anteriorly....(9)
(9) (10) Media forking near base of tegmen.....*Monopsis* Spinola.
(10) (9) Media forking near middle of tegmen...*Neurotmeta* Guerin-Meneville
(11) (12) Vertex distinctly longer in middle than broad, directed upward distally.....*Dictyotangia* gen. nov.
(12) (11) Vertex not longer in middle line than broad across base.....(13)
(13) (14) Vertex with median carina ⋋-shaped, lateral margins slightly incurved before eyes.....(15)
(14) (13) Vertex with median carina ∧-shaped, lateral margins straight.(17)
(15) (16) Vertex as broad as long in mid-line, lateral margins of frons not meeting lateral margins of vertex, a broad callus on anterior margin of vertex.....*Aripoa* gen. nov.

(16) (15) Vertex distinctly broader than long in middle, lateral margins of frons meeting lateral margins of vertex, anterior margin of vertex not callussed ..... *Neotangia* Melichar.
(17) (18) Submarginal carinae of pronotum obsolete, represented only by a hump, species about 6 mm. long, tawny, marked with spots of darker brown ..... *Tangidia* Uhler.
(18) (17) Submarginal carinae of pronotum very sharp, arcuate, species about 8.6 mm. long, uniformly pale green .... *Dioxyomus* gen. nov.
(19) (20) Median carina of vertex simple, unbranched basally .. *Remosa* Distant
(20) (19) Median carina of vertex forked in basal third ..... *Roesma* Fennah.
(21) (22) Vertex longer than broad ..... (27)
(22) (21) Vertex broader than long ..... (23)
(23) (24) Vertex three times as broad as long ..... *Colgorma* Kirkaldy.
(24) (23) Vertex twice as broad as long ..... (25)
(25) (26) Species more than 7 mm. long; lateral pronotal fields and mesopleurites green ..... *Neorudia* gen. nov.
(26) (25) Species less than 7 mm. long; lateral pronotal fields at margin and a spot on mesopleurites piceous ..... *Amapala* Melichat
(27) (28) A row of subapical areoles present ..... *Athestia* Melichar
(28) (27) No such row ..... *Bituga* Fennah

REMOSA Distant

Distant 1906 Ann. Mag. Nat. Hist. (7) 18:355. Genotype, *Dictyophora cultellator* Walker.

"Head longly produced in front of eyes, cephalic process broad at base, gradually but much narrowed on apical half, strongly centrally carinate, the lateral areas oblique, the lateral margins carinate; face long, narrowed in front of eyes, margins subparallel from anterior margins of eyes to a little before clypeus, where they are inwardly oblique, strongly centrally carinate; clypeus centrally carinate, pronotum about as long as eyes, tricarinate; mesonotum about twice as long as pronotum, tricarinate, tegmina about two and a half times as long as broad, subopaque, minutely tuberculate, costal area broad, one-third width of costal cell, devoid of cross-veins, apical area finely and closely reticulate and inwardly defined by an almost straight series of transverse veins, a few cross-veins present on corium basad of nodal line; wings hyaline, with a discal subapical transverse vein; posterior tibiae with three spines." Third valvulae of ovipositor with 13 teeth on apical margin. Aedeagus broad, laterally compressed, apically truncate. Egg subcylindrical, rounded at one pole, obliquely truncate at the other; opercular process laminate, prominent, peri-opercular rim broad, collar-like.

Key to the Species of Remosa Distant

(1) (2) Telson projecting for a third of its length beyond lateral lobes of anal segment; median notch of ventral hind margin of abdominal segment 7 in profile raised into a blunt point (Cuba) ..... *spinolae* Guerin-Meneville
(2) (1) Telson not exceeding lateral lobes of anal segment ..... (3)

(3) (4) Cephalic process scarcely three times as long in middle as wide across base between eyes (Haiti, Sto. Domingo) ..... *cultellator*

(4) (3) Cephalic process 3.8 times as long in middle as wide across base (Jamaica) ..... *kontorhina*, n. sp.

Remosa cultellator (Walker)

(Figs. 45–47)

Dictyophora cultellator Walker, 1858 List Hom. Suppl.:62.

Male. Length, 8.0 mm.; tegmen, 6.5 mm.

Cephalic process about 2.8 times as long in middle as wide across base between eyes; tegmina with intervenal areas of corium minutely papillate.

Pale green; tegmina vitreous with veins and papillae green, wings hyaline, spines on post-tibiae and tarsi tipped with black.

Anal segment with telson not exceeding length of lateral lobes. Aedeagus laterally flattened, dorsal margin concave in profile, ventral margin convex, apex obliquely truncate, width approximately half the length; ventrally a pair of spines, one lying along ventral margin and projecting dorsad at its tip, the second two-thirds as long as the preceding, arising at about the same point, curved to right and upward, a short stout spine at the tip of a broad lobe subapically on right side. Genital styles subovate in lateral view, ventral margin convex, strongly curved upward distally, dorsal margin with a prominent tooth-like lobe near base, and a pair of hooked processes, one directed outward, the other upward and inward, distad of it.

Described from one male taken at Port au Prince, Haiti, by Dr. J. G. Myers (August 17, 1931) and compared by Mr. W. E. China with Walker's female type from the same island.

Remosa kontorhina, new species

(Figs. 7, 43, 44, 71, 72)

Male. Length, 8.8 mm.; tegmen, 5.6 mm. Female. Length, 9.0 mm.; tegmen, 6.0 mm.

Cephalic process 3.8 times as long in middle as wide across base between eyes. Tegmina with intervenal areas of corium minutely papillate.

Pale green; tegmina vitreous with veins and tubercules green, wings hyaline, spines of post-tibiae and tarsi black-tipped.

Anal segment with telson not exceeding length of lateral lobes. Aedeagus laterally flattened, dorsal margin in profile slightly concave, ventral margin convex, apex obliquely truncate; ventrally a pair of spines arising on right side and directed posteriorly, the posterior spine extending near ventral margin to a point two-thirds from base of aedeagus, the anterior spine somewhat remote from the ventral margin, extending for one-third from base; a flattened pigmented lobe, parallel-sided and apically rounded, parallel to ventral margin, arising about two-thirds from base and extending on right side to near apical margin, but not attaining it; distad of this, at apical margin, a small broad-based spine at tip of a subquadrate lamina. Genital styles with ventral margin convex, dorsal margin with a tooth-like lobe near base, and a pair of hooked processes distad of it.

Egg with opercular process laminate, scoop-like, directed somewhat obliquely upward, peri-opercular rim deep, bowl-like in profile, dorsal margin curved. Length 0.9 mm.; length with process 1.4 mm.; width, 0.35 mm.

Described from 6 males and 7 females taken by the writer at Kingston and near Hope, Jamaica, B.W.I. (Nov. 17, 24, 1940) on bushes and on Jasmine. The most obvious points of difference from *cultellator* Wlk. lie in the proportions of the cephalic process and the arrangement of the aedeagal spines. It is almost certainly this species that Van Duzee took at Kingston and Hope and Montego Bays and subsequently assigned to "*Tangia cultellator* Walker" (Bull. Buff. Soc. Nat. Sci. VIII, 5:35, 1907.)

NEUROTMETA Guerin-Meneville

Guerin-Meneville, 1856, Hist. Fisica, Homopteros, p. 180. Genotype, *Neurotmeta sponsa* Guerin-Meneville loc. cit., Myers 1928.

Vertex flattened, more or less produced, lateral margins approximately straight between eyes, then rounded into anterior margin, which is convex, posterior border excavate, at middle about level with anterior margin of eyes, median carina present, not branched before posterior margin; frons longer than broad, lateral margins carinate, gradually and sinuately expanding to below level of antennae, thence more sharply curved inward to suture, which is impressed, median carina present throughout, narrow, not prominent, clypeus with median carina. Pronotum strongly convex anteriorly, posterior margin deeply concave, disc flattened, median carina present, lateral carinae arcuate, diverging posteriorly, a carina near each lateral margin between eye and upper margin of tegula, lateral margin carinate, the carina extending between eye and anterior margin of tegmen; mesonotum broader than long, disc flattened, tricarinate. Tegmina vitreous, about 2.9 times as long as wide, anterior margin slightly convex, apex rounded, sutural margin slightly oblique distad of apex of clavus, costal area scarcely half as wide as costal cell, Sc+R, M, and Cu forking before transverse nodal line, R forking about three-fifths from base, M forking half-way from base, Cu1 forking about one-third from base, the medial sector often branched before nodal line, about 15–17 apical areoles, and 5 or 6 very irregular rows of cross-veins on membrane beyond nodal line; wings typically with R simple to apex, M forked, Cu1a forked, Cu1b simple to apex, Cu2 simple to apex, first and second anal veins joined at their mid-points by a very short transverse bar. Hind tibia with 3 spines. Pygofer in profile with margins sinuately convex. Anal segment elongate, lateral lobes produced, almost twice as long as telson. Aedeagus flattened laterally with several spinose appendages. Genital styles with ventral margin convex, dorsal margin concave, with a pair of hooked processes midway from base, apical margin rounded-truncate. Ovipositor with third valvulae bearing 10 teeth on apical margin. Egg subcylindrical, rounded at one pole, in profile obliquely truncate at the other, peri-opercular rim somewhat deeper anteriorly, insignificant posteriorly, chorionic process tubular.

Neurotmeta bipatriata, new species

(Figs. 6, 26, 27)

Male. Length, 4.8 mm.; tegmen, 4.5 mm. Female. Length, 6.0 mm.; tegmen, 5.4 mm.

Vertex flat, slightly wider across base than long in middle, produced before eyes for distance subequal to length of eye, anterior margin broadly rounded, lateral margins slightly converging anteriorly, posterior border angularly excavate with a small median notch reaching to level of anterior border of eyes, median carina simple, lateral and apical margins carinate.

Pale green; tegmina vitreous, wings hyaline.

Aedeagus with 3 short transverse spines directed towards right at ventral junction of penis with periandrium, the outer two curving slightly posteriorly, the middle curving slightly anteriorly, membrane of penis with 4 subequal spines directed posteriorly, the lower pair curving markedly upward distally, the third not reaching quite as far as the others and less curved distally, the dorsal spine almost straight.

Described from 4 males and 6 females collected by the writer at Mosquito Bay, Nevis, B.W.I. (Jan. 18, 1942) on *Coccoloba uvifera*. A long series of this species was taken by the writer on the same host near Sandy Point, St. Kitts, B.W.I. (Jan. 23, 1942).

Neurotmeta oreas, new species

(Figs. 28, 29)

Male. Length, 5.1 mm.; tegmen, 5.0 mm. Female. Length, 6.0 mm.; tegmen, 5.9 mm.

Vertex flat, slightly wider across base than long in middle, produced before eyes for distance subequal to length of eye, anterior margin broadly rounded, lateral margins slightly converging anteriorly, posterior border angularly excavate with a small median notch reaching to level of anterior border of eyes, median carina simple, lateral and apical margins carinate.

Pale green; tegmina vitreous, wings hyaline.

Aedeagus with 2 short transverse spines at the apparent junction of penis with periandrium ventrally, directed towards the right, the anterior spine broad and flattened, curved somewhat posteriorly at tip, the median spine directed obliquely caudad, penis with 4 slender spines directed posteriorly, the ventral spine curved upward near its tip, the middle pair short, straight, closely approximated, the dorsal spine long, tapering, with the tip slightly deflexed and projecting beyond posterior margin of membrane.

Described from 2 males and 1 female collected by the writer at 1,500 ft. on Chance's Mountain, Montserrat, B.W.I. (May 18, 1940) in forest undergrowth.

Neurotmeta litoralis, new species

(Figs. 30, 31)

Male. Length, 5.3 mm.; tegmen, 4.9 mm. Female. Length, 6.0 mm.; tegmen, 5.9 mm.

Vertex flat, slightly wider across base than long in middle, produced before eyes for distance subequal to length of eye, anterior margin broadly rounded, lateral margins slightly converging anteriorly, posterior border angularly excavate with a small median notch reaching to level of anterior border of eyes, median carina simple, lateral and apical margins carinate.

Pale green; tegmina vitreous, wings hyaline.

Aedeagus with 3 short spines ventrally at apparent junction of penis with periandrium, the spine arising on the left side broad, directed posteriorly at tip, the second spine emerging near its tip, directed to right and obliquely cephalad, the third arising more basally, directed to right and obliquely caudad, crossing the preceding approximately at right angles, penis with 4 slender spines directed posteriorly, the lower pair curved upward distally, the third distinctly shorter and straight, the dorsal spine straight, directed posteriorly and projecting beyond the edge of the membrane.

Described from 15 males and 19 females collected by the writer at Half-moon Bay and at Cades Bay, Antigua, B.W.I. (Aug. 20, Sep. 2, 1943) on *Coccoloba uvifera* and *Caesalpinia* sp.

Neurotmeta dominicana, new species

(Figs. 24, 25, 32, 33)

Male. Length, 5.8 mm.; tegmen, 5.3 mm. Female. Length, 6.4 mm.; tegmen, 6.0 mm.

Vertex flat, slightly wider across base than long in middle, produced before eyes for distance subequal to length of eye, anterior margin broadly rounded, lateral margins slightly converging anteriorly, posterior border angularly excavate with a small median notch reaching to level of anterior border of eyes, median carina simple, lateral and apical margins carinate.

Pale green; tegmina vitreous, wings hyaline.

Aedeagus with 3 short spines ventrally at apparent junction of penis with periandrium, the spine on left side broad, flattened, directed to right, the other two spines approximated and incurved to resemble a closed chelate claw, directed to right, penis with 2 slender spines directed posteriorly, arising distally in upper half, the lower spine slender, rather short, curved upward at its tip, the dorsal spine straight, directed posteriorly, projecting beyond edge of membrane.

Described from 5 males and 6 females collected by the writer at 1,000 ft. in forest undergrowth near Imperial Road, Dominica, B.W.I. (June 11–July 8, 1939.)

NEOTANGIA Melichar

Melichar 1914 Verh. Naturf. Ver. Brunn 53: 77. Genotype, *Tangia angustata* Uhler, Proc. Zool. Soc. Lond. 1895: 59.

Vertex flattened, four-fifths as long in middle as wide across base between

eyes, produced before eyes, lateral margins straight between eyes, slightly incurved distad of them, anterior margin broadly rounded, posterior margin roundly excavated, median carina λ-shaped, the common stalk not quite attaining anterior margin, the fork occurring slightly distad of anterior margin of eyes, the posterior arms approximately trisecting posterior margin, but the distance between them at margin rather less than that on each side (carina to lateral margin), lateral margins carinate, anterior margin only a little thickened; frons with lateral margins meeting anterior carina of vertex, slightly diverging between eyes to below level of antennae, thence curving inwards to suture, median carina percurrent, suture slightly impressed, clypeus medially carinate. Pronotum flat, slightly more than one-half length of vertex, anterior margin excavate behind eyes, strongly convex in middle, posterior margin convex just mesad of tegulae, angularly emarginate in middle, median carina present, lateral carinae of disc diverging posteriorly, slightly curved, a carina on each side sublaterally between eye and inner edge of tegula, lateral margins carinate, extending between eye and costal margin of tegmen; mesonotum broader than long, disc flattened, tricarinate. Tegmina three times as long as wide, anterior margin slightly convex, apical margin asymmetrically rounded, sutural margin straight to apex of clavus, slightly oblique distad of it, costal area about one-fifth width of costal cell, costal cell 1.6 times width of radial cell two-thirds from base, Sc+R not forking before nodal line, but its fork distinctly basad of those of M, Cu1a and Cu1b, Cu1 forking just distad of junction of claval veins, nodal line of cross-veins rather irregular, about 14 areoles at apical margin, 6 to 8 very irregular and incomplete curved lines of cross-veins in membrane; wings typically with R simple at apex, M two-branched, Cu1a three-branched, Cu1b two-branched, Cu2 simple, the first and second anal veins joined at their middle by a distinct transverse bar. Hind tibia with 3 spines.

Anal segment with lateral lobes produced, telson equalling or slightly exceeding them. Pygofer with margin almost straight in profile, lateral angles prominent, forming a right angle. Genital styles with ventral margin convex, apical margin rounded, dorsal margin with a triangular lobe basally, with a pair of hooked processes distad of it, one process being directed outward, the other upward.

Ovipositor with third valvulae armed with 9 teeth on apical margin.

Egg subcylindrical, rounded at one pole, in profile obliquely truncate at the other, chorionic process laminate, scoop-like, peri-opercular rim well developed all round, with a transverse furrow anteriorly.

Neotangia angustata (Uhler)

(Figs. 4, 10, 11, 50, 52, 69, 70)

Tangia angustata Uhler, 1895, Proc. Zool. Soc. Lond.: 59.

Male. Length, 5.1 mm.; tegmen, 5.2 mm. Female. Length, 6.0 mm.; tegmen, 6.1 mm.

Vertex four-fifths as long in middle as wide across base between eyes, lateral margins slightly converging distad of eyes, anterior margin smoothly rounded.

Pale green; tegmina vitreous, wings hyaline.

Aedeagus laterally compressed, ventral margin convex, dorsal margin concave,

apex oblique, rounded-truncate, devoid of spines, a single elongated thick flagellar process arising from ventral line midway along base, directed dorsally, looped anteriorly and ventrally, then curved posteriorly upward and outward to left, the terminal portion sclerotised and markedly sinuate, as shown in figure.

Egg 1.27 mm. long, 0.28 mm. wide; chorionic process on operculum laminate, broadly mitrate in anterior view, scoop-like in profile, narrowly reticulate, the reticulation obscure or absent near margin, canal of process traversing middle, bent near base; peri-opercular rim elevated, more so anteriorly, where it bears a deep transverse groove near distal margin.

Redescribed from 2 males and 6 females taken by the writer in Sharps Valley, St. Vincent B.W.I. (Aug. 19, 1941.) on *Tecoma* and at Kingstown (Aug. 18) on Fiddlewood.

Neotangia mitrata, new species

(Figs. 51, 67, 68)

Male. Length, 4.9 mm.; tegmen, 5.0 mm. Female. Length, 5.7 mm.; tegmen, 5.7 mm.

Vertex four-fifths as long in middle as wide across base between eyes, lateral margins slightly converging distad of eyes, anterior margin rounded.

Pale green; tegmina and wings transparent, veins greenish.

Aedeagus as in *angustata*, laterally compressed, devoid of spines, a single elongated thick flagellar process arising from ventral line midway along base, directed dorsally, looped anteriorly and ventrally, then curved posteriorly upward and outward to left, the terminal portion sclerotised and markedly sinuate.

Egg 1.27 mm. long, 0.33 mm. wide, opercular process mitrate in anterior view, scoop-like in profile, hexagonally reticulate, the reticulation strongly developed to margin, canal of process traversing middle quite straight near base; peri-opercular rim well developed, its sides in anterior view almost straight, a narrow but distinct transverse groove anteriorly near upper margin.

Described from 4 males and 3 females and 8 eggs collected by the writer at Grand Anse, Grenada, B.W.I. (Oct. 17, 1943) on *Coccoloba uvifera*. This species closely resembles *angustata* (Uhl.), but differs in the curvature of the penial flagellum, and in the female in the relative length of the lateral lobes of the anal segment. In *mitrata* the first valvulae of the ovipositor end in 2 large triangular teeth, of which the inner is larger: in *angustata* they end in a moderately prominent outer tooth with a small triangular tooth at the apex. The mitrate lobe on the operculum of the egg in the Grenadan species is hexagonally reticulate to the recurved margins, the hexagons being regular or nearly so; in *angustata* the lobe is not reticulate in the marginal area, and the cells of the reticulum are markedly elongated. The peri-opercular rim has its dorsal lip protruded to a marked extent in *angustata*, while the wall below it is strongly convex. The rim posteriorly is somewhat deeper

in *angustata* than in *mitrata*, while the cells that form the roof-like opercular lid are very distinctly broader in *angustata*. These differences have been found constant in a comparison of 8 eggs of *mitrata* with 10 of *angustata*. It is undoubtedly this species that Uhler had in mind when he wrote of two specimens of *Tangia angustata* taken in St. Vincent:—"They are precisely like others which were secured on the island of Grenada."

Neotangia coronata, new species

(Figs. 65, 66)

Female. Length, 6.0 mm.; tegmen, 6.1 mm.

Vertex as long in middle as wide across base between eyes, lateral margins slightly converging distad of eyes, anterior margin smoothly rounded.

Pale green; tegmina and wings transparent, veins greenish.

Egg subcylindrical, 0.95 mm. long to base of operculum, 1.05 mm. long including chorionic process, 0.28 mm. broad, rounded at one pole, obliquely truncate in profile at the other; chorionic process laminate, about 1.7 times longer than broad, mitrate, but with sides not much incurved basally, reticulation elongated; peri-opercular rim strongly developed all round, dorsal margin concave on sides, rim viewed anteriorly much expanded distally, in lateral view anteriorly convex, with a constriction at junction with egg.

Described from one female and eggs taken by the writer at Soufriere, St. Lucia, B.W.I. (Feb. 21, 1940) on *Inga* sp. This species is distinguished by the proportions of the vertex and by the relatively narrow chorionic lamina of the egg and the diverging sides of the peri-opercular rim as seen in anterior view.

Neotangia caribea, new species

(Figs. 48, 49)

Male. Length, 4.9 mm.; tegmen, 5.9 mm. Female. Length, 6.3 mm.; tegmen, 6.5 mm.

Vertex four-fifths as long in middle as wide across base between eyes, lateral margins slightly converging distad of eyes, anterior margin smoothly rounded.

Pale green; tegmina and wings transparent, veins greenish.

Aedeagus laterally compressed, ventral margin convex, dorsal margin concave, apex obliquely rounded-truncate, devoid of spines, a single elongated thick flagellar process arising from ventral line midway from base directed dorsally, looped anteriorly and ventrally, then curved posteriorly upward and outward to left, the terminal portion sclerotised and evenly, not sinuately curved, as shown in figure.

Egg 1.2 mm. long, 0.28 mm. wide, subcylindrical, chorionic process laminate, mitrate in anterior view, scoop-like in profile, reticulation elongated, canal of middle line visible only at apex; peri-opercular rim deep, well-developed, with sides convex and with a broad deep furrow anteriorly below upper edge, which is thickened and protruded; the lateral row of parallel vertical furrows not deep.

Described from 15 males and 20 females taken by the writer at 1,000 ft. near Saltoun, Dominica, B.W I. (June 18–26, 1939) on forest undergrowth, chiefly *Palicourea crocea* and *Miconia* sp. This species differs from *angustata* in the shape of the flagellar process of the aedeagus, and from this and all the other species in the details of the opercular ornamentation of the egg.

DICTYOTANGIA, new genus

Vertex flattened basally, slightly tectiform and upturned distally, produced before eyes for one and a quarter times their length, longer in middle than wide across base between eyes (3:2), lateral margins slightly diverging anteriorly between eyes, sinuately narrowed distally, anterior margin rounded, posterior margin angularly excavated, lateral margins carinate, median carina simple in anterior two-thirds, forked in basal third, the portion of posterior margin included between the arms being greater than that on each side; frons longer than wide (2.1:1), lateral margins sinuately expanding to below level of antennae, thence incurved to suture, median carina present throughout; clypeus short, medially carinate. Pronotum short, flat, anterior margin concave behind eyes, convex in an acute angle in middle, posterior margin convex just mesad of tegulae, angularly emarginate mesally, median carina present, lateral carinae of disc diverging posteriorly, slightly curved, not quite attaining margin, a submarginal carina present near each side between eye and tegula, lateral margins carinate between eye and costal border of tegmen; mesonotum broader than long, disc flattened, tricarinate. Tegmina 2.7 times longer than wide, anterior margin convex, apical margin asymmetrically rounded, sutural margin straight, scarcely oblique distad of apex of clavus, costal margin less than one-sixth width of costal cell, which is 1.4 times as wide as radial cell, Sc+R and M forking at nodal line, Cu1 forking slightly distad of junction of claval veins, about 15 apical areoles present and about 4 broken irregular lines of cross-veins in membrane, costal area and corium devoid of cross-veins. Wings typically with R simple to apex, M forked before apex, Cu1a forked once before apex, Cu1b forked once, Cu2 simple, the first and second anal veins joined in middle by a short transverse bar. Hind tibia with 3 spines.

Anal segment with lateral lobes produced, telson slightly exceeding them. Pygofer with margins straight, lateral angles produced and acute. Aedeagus laterally flattened, with a single spine curved in a semicircle basad of middle. Genital styles with ventral margin convex, apical margin semicircularly rounded, dorsal margin concave with a rounded eminence near base and 2 hooked spines distad of it, the outer spine being one-third as long as the inner.

Ovipositor with third valvulae beset with 9 teeth on apical margin.

Egg subcylindrical, chorionic process of operculum elongated with a tapering flange on each side in basal half, simple and tubular in apical half, slightly expanded at apex, directed anteriorly, periopercular rim insignificant posteriorly but greatly produced anteriorly, one-sixth of the length of the egg, dorsal margin with lip curved outward.

Genotype, *Dictyophara emarginata* Uhler.

Dictyotangia emarginata (Uhler), new combination
(Figs. 5, 9, 16, 17, 41, 42, 63, 64)

Dictyophara emarginata Uhler, 1895 Proc. Zool. Soc. Lond.: 58.

Male. Length, 5.5 mm.; tegmen, 5.4 mm. Female. Length, 6.2 mm.; tegmen, 6.0 mm.

Pale green; tegmina and wings transparent, veins greenish.

Aedeagus laterally compressed, ventral margin convex, dorsal margin concave with a basal eminence, apical margin irregularly rounded, a single slender spine arising on left near base, curving through 180° upward to point antero-vertically at tip.

Egg 1.1 mm. long, 0.3 mm. wide, subcylindrical, rounded at one pole, operculate at the other, chorionic process tubular, laterally flanged in basal half, tubular and directed obliquely anteriorly in distal half, peri-opercular rim very narrow posteriorly, extended upward for one-sixth length of egg anteriorly, with distal margin curved outward in a short lip, surface of produced rim transversely rugose.

Described from 10 males and 8 females taken by the writer at Petit Bordel, St. Vincent, B.W.I. (Aug. 15, 1941) on *Croton* and low bushes. Muir placed this species in *Neotangia* Mel. but the resemblance is not more than superficial, as the vertex is longer than in *Neotangia*, the median carina of the vertex is more widely forked, the tegmina are proportionately shorter (length: width), and more bluntly rounded at apex, the proportionate width of costal area, costal cell and radial cell are different, and the number of rows of cross-veins is markedly less, while the genital styles, the aedeagus and the egg all differ in form from the corresponding structures in *Neotangia*, and in the case of the aedeagus and egg the differences are profound. Nothing resembling this genus has been found elsewhere.

DIOXYOMUS, new genus

Vertex flattened, broader than long (about 1.6:1), lateral margins straight, carinate, anterior margin rounded, very markedly thickened between vertex and frons, median carina ∧-shaped with the common stalk scarcely one-half as long as either arm of fork, not quite attaining anterior margin, posterior arms of fork equally trisecting posterior margin; frons almost flat, lateral margins almost straight between eyes, sinuately diverging to below level of antennae thence curved inward to suture, median carina rather broad, percurrent; clypeus short, medially carinate. Pronotum with anterior margin deeply concave behind eyes, strongly convex before disc, posterior margin angularly concave at tegulae, angularly convex just mesad of tegulae, angularly emarginate in middle, median carina distinct, lateral carinae of disc prominent, diverging posteriorly, arcuate, a very prominent submarginal carina near each side between eye and tegula, slightly arcuate, lateral margin between eye and costal margin of tegmen sharply carinate, the areas between lateral carinae of disc and submarginal carinae, and between latter and marginal carinae markedly hollowed out. Tegulae prominently carinate; mesonotum broader than long, disc almost flattened, tricarinate. Tegmina 2.8 times as long as wide, anterior

margin convex, apical margin asymmetrically rounded, sutural margin straight to apex of clavus, very slightly oblique distad of it; costal area one-sixth width of costal cell, the latter 1.3 times width of radial cell, veins Sc+R, M, Cu1a and Cu1b not forked before nodal line of transverse veins, Cu1 forked just distad of junction of claval veins; nodal line occurring seven-elevenths from base of tegmen, approximately 15 apical areoles present, and about 5 irregular broken lines of cross-veins in membrane. Wings with R simple to apex, M forked, with 2 branches reaching margin, Cu1a with 2 branches at margin, Cu1b with 4 branches, Cu2 simple to apex, the first two anal veins joined by a distinct transverse bar at middle. Hind tibia with 3 spines.

Anal segment of male with lateral lobes produced, telson subequal to them in length, or very slightly longer. Pygofer with lateral margins almost straight, lateral angles obtuse, rounded. Aedeagus deep, laterally compressed, ventral margin convex, dorsal margin almost straight, apex oblique, a single curved spine near base. Genital styles with ventral margin convex, dorsal margin with a triangular eminence near base, with a pair of hooked processes distad of it, the shorter process directed outward at apex.

Ovipositor with third valvulae armed with 10 teeth on apical margin.

Egg subcylindrical, rounded at one pole, obliquely truncate in profile at other, chorionic process of operculum tubular, slender, directed upward and anteriorly, slightly expanded at apex; peri-opercular rim distinct posteriorly and at sides, anteriorly produced upward and forward, with dorsal margin curved into a shallow lip.

Genotype, *Tangidia uhleri* Muir.

Dioxyomus uhleri (Muir), new combination
(Figs. 2, 62)

Tangidia uhleri Muir, 1931 Ann. Mag. Nat. Hist. 10(7):305.

Male. Length, 5.4 mm.; tegmen, 6.2 mm.

Vertex broader than long (1.6:1).

Pale green, tegmina vitreous with a greenish tinge, veins green, wings hyaline.

Aedeagus laterally compressed, ventral margin convex, dorsal margin rather less convex, apex rounded, with a cleft longitudinally in lower half; a slender spine arising on left side near base and curving through 180° as shown in figure.

Described from two males taken by the writer at Grande Anse, Grenada (Mar. 31, 1941) on *Coccoloba uvifera*. A drawing of the dissected genitalia was compared with those of Muir's type and was found to correspond exactly. The drawing reproduced in the plates was made by Mr. China from the type. This species is apparently confined to Grenada.

Dioxyomus major, new species
(Figs. 73, 74)

Female. Length, 7.1 mm.; tegmen, 7.4 mm.

Vertex broader than long (1.4:1).

Pale green; tegmina vitreous, tinged slightly green, veins green, wings hyaline.

Egg subcylindrical, rounded at one pole, obliquely truncate in profile at the

other, 1.1 mm. long without chorionic process, 0.3 mm. wide, chorionic process tubular, slender, directed obliquely anteriorly upward, slightly expanded at apex; peri-opercular rim slightly raised posteriorly, narrow on sides, raised anteriorly obliquely upward.

Described from 3 females and 3 eggs taken by the writer at 1,000 ft. in forest near Saltoun, Dominica, B.W.I. (June 15, 1939) on *Gonzalagunia spicata* and *Miconia* sp. The species is distinguished by the proportions of the vertex and by the shape of the opercular ornamentation of the egg, and is apparently confined to Dominica.

Dioxyomus ganymedes, new species
(Figs. 18, 19, 75)

Female. Length, 7.8 mm.; tegmen, 7.5 mm.

Vertex 1.6 times broader than long.

Pale green; tegmina vitreous, tinged slightly greenish, wings hyaline.

Egg subcylindrical, rounded at one pole, obliquely truncate in profile at other, 1.05 mm. long with opercular rim, 0.3 mm. wide, chorionic process of operculum tubular, slender, sinuately directed anteriorly; peri-opercular rim deep all round, anterior side slightly convex and produced, posterior side straight, with a short lip on upper margin, sides rugose in lattice-like pattern.

Described from 2 females collected by the writer in Sharps Valley, St. Vincent B.W.I. (Aug. 27, 1941) at 800 ft. on *Inga* sp. This species is apparently confined to St. Vincent, and differs from *uhleri* in the proportions of the vertex and from *major* in the deeper and cuplike peri-opercular rim of the egg.

Dioxyomus (?) longiceps (Lethierry)

Alcestis longiceps Lethierry, 1881. Ann. Soc. Ent. Belgique XXV,:13.

"Pallidissima, fere alba; homelytris translucidis; vertice longitudine non latiore, antice rotundato, elevato-marginato, lateribus rectis, elevato-marginatis; in medio carinula postice furcata, marginem anticum non attingente, instructo. Scutellum tricarinatum, carinis lateralibus arcuatis. Tegmina ampla, abdomine duplo longiora et latiora. Long. 10 mill. Guadeloupe, 1 ex."

The characters of the vertex and of its median carina serve to place this species in *Neotangia* or *Dioxyomus*, while the length, if it is permissible to judge from known species, would certainly show it to belong to the latter genus. The data of value in distinguishing this species are the length (which is that of the insect measured from apex of vertex to apex of folded tegmina) somewhat exceeding the length of the largest species described above, and the distribution (Guadeloupe) which must be considered an important part of the specific description.

TANGIDIA Uhler

Uhler, 1895 Proc. Zool. Soc. Lond.: 59. Genotype, *Tangidia alternata* Uhler.

Vertex flat, slightly sunken between carinae, broader than long (about 1.6:1),

lateral margins straight between eyes, curving inward distally and becoming thickened, anterior margin rounded and thickened, posterior margin excavate, middle of border not reaching to level of anterior margin of eyes, median carina thick, Λ-shaped with its apex not quite attaining the anterior margin, lateral margins coarsely carinate; frons longer than broad (1.3:1), curved, lateral margins diverging to level of antennae, thence curved inward to suture, which is impressed, median carina distinct, percurrent, lateral margins carinate, clypeus short, medially carinate. Pronotum with anterior margin concave behind eyes, strongly convex on disc, posterior margin convex mesad of tegulae, angularly emarginate in middle, surface of disc somewhat hollowed between carinae, median carina present, coarse, lateral carinae of disc diverging posteriorly, slightly arcuate, no distinct submarginal carina between eyes and tegulae, lateral margins carinate; mesonotum broader than long, surface of disc slightly rounded, tricarinate. Tegmina 2.9 times as long as broad, anterior margin convex, apical border asymmetrically rounded, sutural margin straight to apex of clavus, very slightly oblique distad of it, costal margin one-sixth width of costal cell, the latter one and a quarter times as wide as radial cell; Sc+R forking twice before nodal line of transverse veins, M not forking before cross-veins, Cu forking just distad of junction of claval veins, nodal line, measured at M three-fifths from base of tegmen, 13–15 apical areoles, 3 broken and irregular lines of cross-veins on membrane. Wings typically with R simple to apex, M with 2 branches reaching margin, Cu1a with 2 branches, and Cu1b with 2, the first two anal veins contiguous at their mid-points, or at most linked by an extremely short transverse bar. Hind tibia with 3 spines.

Anal segment of male with lateral lobes produced, telson not or scarcely exceeding them. Pygofer with lateral angles acutely produced, lateral margins oblique, posterior ventral margin concave. Aedeagus laterally compressed, deep, with a basal periandrial spine and a short apical penial spine. Genital styles with ventral margin almost straight, slightly excavate, turned dorsally distally, apical margin obliquely truncate, dorsal margin with a prominent triangular eminence near base, a pair of spinose processes distad of it, the shorter directed outward, the longer twice as long as the preceding, sinuate, directed upward and mesad.

Ovipositor with third valvulae armed with 9 teeth on apical margin.

Egg subcylindrical, rounded at one pole, obliquely truncate in profile at other, chorionic process of operculum tubular, peri-opercular rim very shallow, though distinct, raised anteriorly.

All known members of genus yellowish brown, with darker brown markings on vertex, thorax, hind tibiae, abdominal tergites, and veins of tegmina, these colours being present in living as well as in preserved material.

Tangidia alternata Uhler

(Figs. 1, 12, 13, 34–38)

Uhler 1895 Proc. Zool. Soc. Lond.: 60.

Male. Length, 4.5 mm.; tegmen, 4.6 mm. Female. Length, 5.9 mm.; tegmen, 5.1 mm.

Vertex broader than long (1.6:1).

Tawny; dorsal margin and basal part of lateral carinae of frons piceous; a line across base of frons, a stripe before and behind each eye extending on to pronotal lobe, 3 spots on each side of median carina of vertex, a zig-zag broad line on each side of middle of pronotum, a line inside each lateral carina of mesonotum, and 3 short lines laterad of disc on each side, abdominal tergites on each side of middle, and a band across hind tibia, brown. Tegmina translucent yellowish, veins of corium interruptedly, apical veins and cross veins wholly brown. Wings hyaline.

Aedeagus deep, laterally compressed, ventral margin almost straight, curved upward distally, dorsal margin sinuate, slightly convex, apical margin rounded, a curved spine arising on left in basal half looping upward then forward and curving ventrally to point obliquely posteriorly, a short spine on upper half of penis directed posteriorly to margin then bent ventrad about its mid-point through 95° to point ventrally.

Egg subcylindrical, 0.9 mm. long, 0.28 mm. broad, rounded at one pole, obliquely truncate in profile at other, chorionic process slender, tubular, directed anteriorly; peri-opercular rim narrow, about twice as high anteriorly as posteriorly; operculum very slightly domed, traversed by a minute lattice of crossed furrows.

Redescribed from 2 males and 2 females taken by the writer at 200 ft. in Petit Bordel Valley, St. Vincent, B.W.I. Aug. 26, 1943) on low bushes.

Tangidia fugax, new species
(Figs. 39, 40)

Male. Length, 4.7 mm.; tegmen, 5.0 mm. Female. Length, 6.0 mm.; tegmen, 5.8 mm.

Vertex broader than long (1.8 to 1).

Tawny; margins of vertex, two oval spots inside lateral margins of vertex, a broad line along base and lateral margins of frons, a broad line overlying median carina of frons, and sometimes a short line overlying middle portion of median carina of clypeus, a round punctate spot on each side of middle of pronotum, a small spot behind each eye, an irregular suffusion on mesonotum, both on disc and on lateral fields, a small darker spot basally on each side of median carina, and veins of tegminal corium yellowish brown; carinae of mesonotum, tergites of abdomen, transverse veins of tegmina and veins of wings fuscous; wing membrane very slightly infuscate.

Aedeagus laterally compressed, ventral margin almost straight, curved upward distally, dorsal margin sinuate, apical margin rounded, a slender spine arising on left in basal half, directed posteriorly, looping upward then curving to point ventrally, a short spine on upper half of penis directed posteriorly and bent ventrally in middle through 45° to point obliquely postero-ventrally.

Egg subcylindrical 0.9 mm. long, 0.28 mm. broad, rounded at one pole, obliquely truncate in profile at other, chorionic process slender, tubular, directed anteriorly; peri-opercular rim narrow, about twice as high anteriorly as posteriorly; operculum very slightly domed, with a lattice-like pattern of crossed furrows.

Described from 9 males and 2 females taken by the writer at 1,000 ft. near Saltoun, Dominica, (June 11–20, 1939) on forest undergrowth. This species differs from *alternata* Uhler in the presence of a broad yellowish-brown band around the base and lateral margins of the frons, and overlying the median carina, and in other details of colouration. The proportions of the vertex and the shape of the aedeagal spines afford the principal morphological means of distinguishing the species. *T. fugax* has not been found outside Dominica, just as *alternata* Uhl. has not been found outside St. Vincent.

Tangidia triangulator (Lethierry), new combination

Alcestis triangulator Lethierry, 1881. Ann. Soc. Ent. Belgique, XXV,:14.

"Pallidissima: homelytris translucidis, fascia irregulari transversa sub-basali nigra, maculatisque nigris ante medium positis, una sub-suturali, caeteris minus distinctis, discoidalibus, ornatis: amplis, tertia parte abdomine longioribus. Vertice longitudine non latiore, antice et lateribus elevato-marginato, anterius rotundato; in parte basali carinae duae obliquae in angulum ante apicem conjunguntur. Scutellum tricarinatum, carinis lateralibus arcuatis. Long. 6 mill. Guadeloupe, 1 ex."

The characters of the vertex together with the size indicate that this species is a *Tangidia*. The specific characters include the colouration and the distribution, and the former, if typical of *triangulator*, sets it quite apart from the other species.

It is perhaps worth noting that in the description given in French the tegminal markings, apart from the irregular transverse fascia near the base, which is piceous, are given as brown, not black as quoted above.

ARIPOA, new genus

Vertex slightly broader than long (1.1:1), flattened, the surface slightly sunken, lateral margins almost straight, anterior margin acutely rounded, lateral margins carinate, thickened distad of eyes, anterior margin thickened, posterior margin widely excavate, median carina coarse, λ-shaped, the common stalk being almost as long as the arms, and not quite attaining anterior margin, arms of forked carina almost exactly trisecting posterior margin of vertex, frons longer than broad (1.5:1), slightly tectiform at base, flattened distally, lateral margins straight between eyes, thence diverging to level of antennae, and curving inward to suture, median carina percurrent, broad, rather shallow; clypeus short, medially carinate. Pronotum with anterior margin concave behind eyes, strongly convex in middle, posterior margin concave before tegulae, convex just mesad of tegulae, almost rectangularly emarginate in middle, median carina coarse, lateral carinae of disc diverging posteriorly, arcuate, scarcely attaining posterior border, submarginal carina on each side between eye and tegula distinct and thickened, lateral margins carinate between eye and costal margin of tegmen, the surface of the pronotum between submarginal and marginal carinae not hollowed out; ventro-lateral lobes of

pronotum with ventral margin slightly tapering posteriorly towards lateral carina, apex of lobe evenly rounded; tegulae not carinate; mesonotum broader than long, tricarinate. Tegmina 2.7 times as long as wide, costal margin convex, apical margin slightly asymmetrically rounded, sutural margin straight, costal margin one-seventh width of costal cell, the latter 1.5 times as wide as radial cell, Sc+R, M, Cu1a and Cu1b forking at transverse line of cross-veins, which is situated five-ninths from base of tegmen; Cu1 forking slightly basad of junction of claval veins; about 17 apical areoles present and about 6 broken irregular lines of cross-veins on membrane. Wings with R simple to apex, M simple at apex, Cu1a with 2 branches at margin, Cu1b with 3 branches, Cu2 simple, the first and second anal veins joined distad of middle. Hind tibia with 3 spines.

Anal segment with lateral angles moderately produced, telson exceeding them.

Ovipositor with third valvulae armed with 9 teeth on distal margin.

Egg subcylindrical, rounded at one pole, obliquely truncate in profile at other, operculate, chorionic process of operculum tubular, slender; peri-opercular rim insignificant.

Genotype, *Aripoa silvana* n. sp.

Aripoa silvana, new species
(Figs. 3, 20, 76, 77)

Female. Length, 6.2 mm.; tegmen, 6.3 mm.

Vertex broader than long (1.1:1).

Pale green; eyes red, tegmina vitreous, slightly tinged greenish, wings hyaline.

Egg 0.9 mm. long, 0.3 mm. broad, subcylindrical, smooth, peri-opercular rim absent, represented only by a slight thickening anteriorly, chorionic process of operculum slender, tubular, about one-quarter length of egg, directed obliquely anteriorly and upward, operculum very slightly domed.

Described from one female collected by the writer in St. John's Valley, Northern Range, Trinidad, B.W.I. (Sept. 20, 1942) on low bushes.

Aripoa munda (Muir), new combination

Neotangia munda Muir, 1931. Ann. Mag. Nat. Hist. 10(7):302.

Muir describes *munda* as differing from *Neotangia angustata* (Uhl.) in having the tegmina wider, the apex more bluntly rounded, the vertex narrower and its sides more parallel, its length in the middle being subequal to the width, and the median carina forking at about the middle. These characters, which are supported by other less significant details in the description, indicate that *munda*, a species from British Guiana, should be placed in *Aripoa*.

COLGORMA Kirkaldy

Kirkaldy, 1904. Ent. 37:279.
Genotype, *Achilus dilutus* Stål, 1859. Eugen. Resa, 4.: 271.

The writer has examined Godman and Salvin material identified by Fowler as this species. It is generically distinct, and is distinguished by the following characters.

Vertex about three times as broad as long, shallowly convex anteriorly, disc of pronotum broad, disc of mesonotum longer than broad. Tegmina with Sc+R not longer than M on corium, about as long, nodal line transverse from R to apex of clavus, not oblique; Sc+R and M not forked before nodal line, Cu forked once at distal third; outer subapical areole two-thirds length of middle pair.

NEORUDIA, new genus

Vertex wider than long (about 2:1), anterior margin rounded, posterior margin angulately excavate, disc depressed, lateral margins and median line stoutly carinate; frons not twice as long as broad. Pronotum with disc broad, carinae prominent, lateral carinae long, diverging from each other basad at an angle of about 70°, disc sunken between carinae; mesonotum with disc longer than broad, ovate. Tegmina with Sc+R and M not forked on corium, Cu forked once; Sc+R distinctly longer than M on corium, Cu forked once at distal fifth, nodal line arcuate towards base; 6 subapical areoles along nodal line, outer areole about half length of middle two.

Genotype, *Rudia proxima* Fowler, 1904, Biol. Cent.-Amer. Rhynch. Hom. 1:104.

The remaining genera of West Indian Tambiniinae form a natural group and stand apart in having an elongate frons, a vertex not broad and a mesonotum that is about twice as wide as long, with the disc short and subquadrate, not ovate, and its lateral carinae not incurved basally. One genus of this group, *Arenasella* Schmidt (from Central and South America) would fall according to the existing tribal arrangement into the *Paricanini*, while the remainder would fall into the *Tambiniini*. Such a division would obscure the natural affinities of these genera so the writer proposes for their reception a new tribe, *Cyphoceratopini*, characterised by having the disc of the vertex narrow or semi-lunate, the disc of the pronotum small or replaced by a tectiform ridge with the median carina at the summit, the disc of the mesonotum short and subquadrate, not ovate, and the mesonotum about twice as broad as long; the tegmina with only a nodal and a subapical line of transverse veins. Members of this group all appear to be brightly marked with red or black, but the presence of these colours is not confined to this tribe. The genera placed here include *Cyphoceratops* Uhl. (type, *C. furcata* Uhl.), *Tangiopsis* Uhl. (type, *T. tetrastichus* Uhl.), *Parahydriena* Muir (type, *P. hyalina* Muir), *Achilorma* Metcalf (type *Achilus bicinctus* Spin.), *Arenasella* Schmidt (type *A. rubrovittata* Schmidt), *Ubis* and *Chasmacephala* described below.

KEY TO THE GENERA OF CYPHOCERATOPINI

(1)(2) Vertex narrow, longer than broad, hollowed out..... (3)
(2)(1) Vertex as broad as long or broader, not hollowed..... (7)
(3)(4) Disc of vertex deeply hollowed..... (5)
(4)(3) Vertex with a vertical triangular plate medially
.....*Parahydriena* Muir.
(5)(6) Lateral margins of vertex pointed in middle..*Cyphoceratops* Uhler.
(6)(5) Lateral margins of vertex horizontal.....(11)
(7)(8) Vein Sc+R in corium longer than M..... (9)
(8)(7) Vein Sc+R in corium shorter than M.....*Tangiopsis* Uhler.
(9)(10) Nodal line bisecting tegmen..... *Arenasella* Schmidt.
(10)(9) Nodal line markedly distad of middle of tegmen.....
Achilorma Metcalf.
(11)(12) Pronotum medially tectiform, devoid of disc.....
Chasmacephala gen. nov.
(12)(11) Pronotum with an elevated disc.....*Ubis* gen. nov.

Tribe CYPHOCERATOPINI

UBIS, new genus

Vertex longer than broad (1.5 to 1), anterior margin convex, lateral margins parallel, posterior margin angulately excavate, lateral margins raised, about horizontal in profile, median carina strong, as high as margins, disc much depressed, frons elongate, ampliate before suture. Pronotum with disc narrowly triangular, elevated, median and lateral carinae distinct, the latter diverging from each other at about 45°, mesonotum twice as broad as long, disc subquadrate, tricarinate. Tegmina with Sc+R and M simple on corium, of equal length, Cu forked in distal third, only nodal and subapical lines of transverse veins present, 6 subapical areoles, the outer not half as long as middle pair. Nodal line almost transverse, scarcely arcuate.

Genotype, *Rudia verticalis* Fowler, 1904. Biol. Cent.-Amer. Rhynch. Hom. I.:105.

CHASMACEPHALA, new genus

Vertex longer than broad (1.2:1), lateral margins subparallel, slightly incurved between eyes; anterior margin shallowly rounded, posterior margin deeply excavate, vertex deeply hollowed out between eyes, rounding smoothly into frons anteriorly, lateral margins raised, stoutly carinate; frons twice as long as broad, lateral margins sinuately expanding to below level of antennae, thence curved inward to suture, which is not impressed; lateral margins carinate, median carina broadly raised; clypeus short, broadly carinate in middle. Pronotum short, produced anteriorly into emargination of vertex, shallowly angularly emarginate posteriorly, median carina distinct, raised on a tectiform eminence, lateral carinae of disc absent, lateral margins carinate, submarginal carinae absent; tegulae not carinate, mesonotum much broader than long, tricarinate; tegmina with costal area one-sixth width of costal cell, devoid of cross-veins, costal cell subequal in width to radial cell, Sc+R and M forking at

nodal line of transverse veins; Cu1 forking a little basad of apex of clavus, much distad of junction of claval veins; about 13 apical areoles present, a single line of transverse veins on membrane forming 6 subapical areoles. Wings with R simple to apex, M forked, Cu1a forked, with 2 branches reaching margin, Cu1b forked, with 2 branches, first two anal veins joined for a short distance distad of middle. Hind tibia with 3 spines.

Anal segment of male short, lateral angles thickened or shortly produced. Pygofer with lateral angles distinct, ventral posterior margin medially notched. Aedeagus laterally compressed, with about 4 spines present on penis. Genital styles broad, ventral margin convex, apical margin rounded, dorsal margin with a triangular eminence near base, with 2 processes distad of it, subequal in size, curved anteriorly at tip.

Ovipositor with third valvulae armed with 9 teeth.

Egg subcylindrical, rounded at one pole, obliquely truncate in profile at other, chorionic process of operculum principally laminate, with a short apical tubular projection, apparently canaliculate; peri-opercular rim distinct, narrow, somewhat produced anteriorly.

Genotype, *C. pluvialis* n. sp.

Chasmacephala pluvialis, new species

(Figs. 8, 14, 15, 58, 59)

Male. Length, 4.8 mm.; tegmen, 4.3 mm. Female. Length, 6.0 mm.; tegmen, 5.1 mm.

Vertex twice as long in greatest length as wide across base.

Bright green; lateral margins of frons, median carina of frons and clypeus broadly orange-yellow or crimson red, abdomen sometimes red; legs dark testaceous or brown; tegmina hyaline, tinged dull ivory, veins fuscous; wings hyaline, apical portion of anal lobe fuscous except in posterior third, veins fuscous.

Anal segment with lateral angles thickened, not produced, telson distinctly exceeding them in length. Pygofer with lateral angles not produced posteriorly in a point, but forming an obtuse angle. Aedeagus laterally compressed, ventral margin convex, dorsal margin concave, a small lobe on dorsal margin of periandrium at apex directed obliquely upward and backward; penis with 2 straight spines of equal length ventrally near base, directed posteriorly, 2 much smaller spines in middle of penis, the lower straight, directed posteriorly, the dorsal strongly curved. Genital styles with paired processes on dorsal margin adpressed to distal portion, being almost received into a groove, the triangular eminence at base of dorsal margin with a base much wider than the length of either side.

Egg subcylindrical, rounded at one pole, operculate at other, chorionic process tubular in distal portion, projecting somewhat anteriorly from the upper margin of an almost semi-circular laminate proximal portion, peri-opercular rim narrow, obliquely produced anteriorly. Length 1.0 mm., with ornamentation but excluding apical tube, 1.15 mm., width 0.3 mm.

Described from 18 males and 26 females taken by the writer

at 1,000 ft. near Saltoun, Dominica (June 11—July 8, 1939) on ferns in forest. This species is distinguished by the shape of the pygofer, of the aedeagus and of the genital styles.

Chasmacephala tristis, new species

(Figs. 53, 54, 60, 61)

Male. Length, 4.5 mm.; tegmen, 4.3 mm. Female. Length, 5.4 mm.; tegmen, 5.4 mm.

Vertex twice as long in its greatest length as wide across base.

Bright green, median carina of frons orange yellow, tegmina hyaline, tinged dull ivory, veins fuscous, wings hyaline, apical portion of anal lobe, except in posterior third, fuscous, veins dark.

Pygofer with lateral angles acutely pointed, lateral margins slightly concave, ventral margin medially notched. Aedeagus laterally compressed, ventral margin convex, dorsal margin concave, periandrium with a flattened lobe, ovate in side view, projecting above apex of penis; penis with apex in form of a broad uncinate lobe, 2 spines basally on penis directed posteriorly, the anterior curved obliquely ventrally at tip, the posterior straight, near apex of penis 2 shorter spines directed posteriorly and obliquely upward, the lower spine straight, the dorsal spine very slightly curved upward in apical half. Genital styles rounded at apex, dorsal margin with the triangular eminence with its base wider than the length of its sides, the two processes distad of it subequal, remote from ascending dorsal margin distad of them.

The egg as in *pluvialis*.

Described from 4 males and 3 females collected by the writer at 1,000 ft. in forest near Three Rivers Settlement, St. Vincent B.W.I. Sept. 4th, 1941, on tree-ferns. This species is distinguished by the details of the male genitalia, and is apparently confined to St. Vincent.

Chasmacephala furtiva, new species

(Figs. 55–57)

Male. Length, 5.0 mm.; tegmen, 4.8 mm.

Vertex twice as long in greatest length as wide across base.

Bright green; lateral margins of frons, median carina of frons and clypeus broadly orange-yellow, legs dark testaceous; tegmina hyaline, tinged dull ivory, veins fuscous; wings wholly hyaline, veins testaceous.

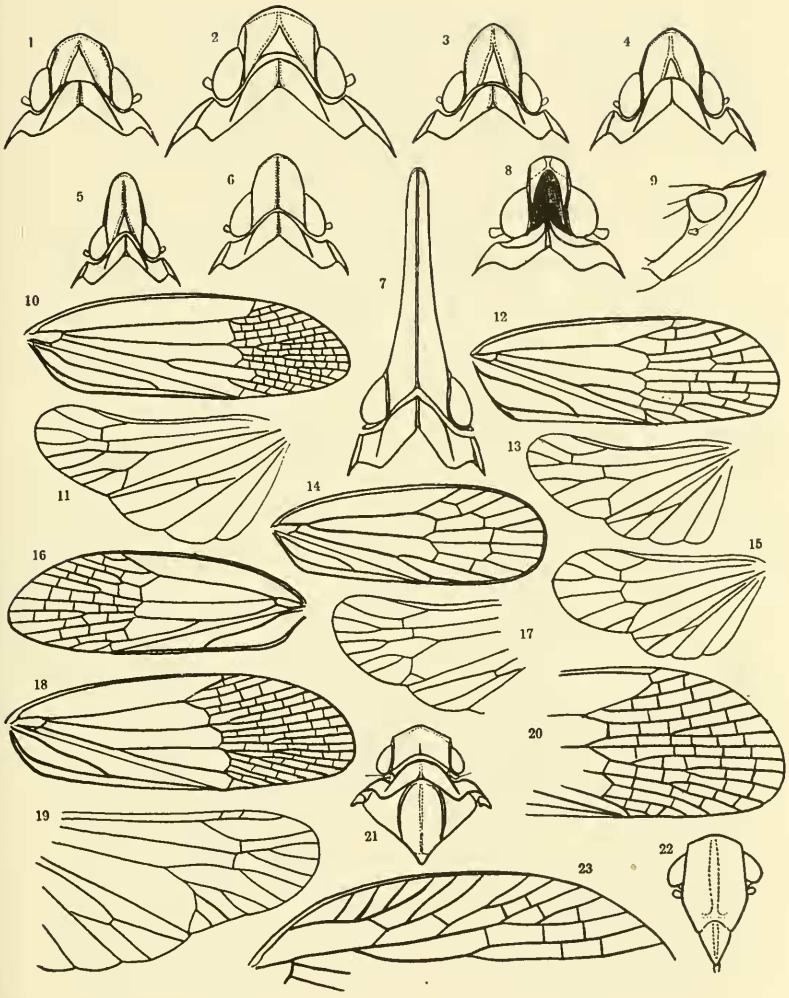
Anal segment with lateral angles slightly produced, telson not exceeding them in length. Pygofer with lateral angles acutely pointed, lateral margins straight, oblique. Aedeagus laterally compressed with ventral margin convex, dorsal margin with a large anvil-shaped periandrial lobe directed posteriorly; penis curved upward distally into a broad sub-hamate lobe, the lobe touching that of the periandrium on its inner margin, causing the end of the aedeagus to appear rounded; a pair of penial spines ventrally, directed posteriorly, the basal spine slightly deflexed towards apex, the posterior spine almost straight, penis distally with 3 spines, 2 close together and directed posteriorly,

the lower being slightly turned dorsad near its apex, the third spine very small, close to dorsal margin, distinctly basad of preceding two, curved obliquely upward and caudad. Genital styles with ventral margin convex, apical margin rounded, dorsal margin with a triangular eminence near base, with a pair of processes, hooked distally, behind it on margin, these processes not being adpressed to the distal part of the margin.

Described from 9 males collected by the writer at 1,000 ft. in forest near Quilesse, St. Lucia B.W.I. (Mar. 20-22, 1939), on *Cyathea*. This species is distinguished by the shape of the anal segment, aedeagus, and penial spines, and by the absence of fuscous markings on the anal lobe of the wings.

Explanation of Plates

1. *Tangidia alternata* Uhl., head and pronotum.
2. *Dioxyomus uhleri* (Muir), head and pronotum.
3. *Aripoa silvana*, n.sp., head and pronotum.
4. *Neotangia angustata* (Uhl.), head and pronotum.
5. *Dictyotangia emarginata* (Uhl.), head and pronotum.
6. *Neurotmeta bipatriata*, n.sp., head and pronotum.
7. *Remosa kontorhina*, n.sp., head and pronotum.
8. *Chasmacephala pluvialis*, n.sp., head and pronotum.
9. *Dictyotangia emarginata* (Uhl.), head in profile.
10. *Neotangia angustata* (Uhl.), tegmen.
11. *Neotangia angustata* (Uhl.), wing (drawn from type female by W. E. China.)
12. *Tangidia alternata* Uhl., tegmen.
13. *Tangidia alternata* Uhl., wing (drawn from male type by W. E. China.)
14. *Chasmacephala pluvialis*, n.sp., tegmen.
15. *Chasmacephala pluvialis*, n.sp., wing.
16. *Dictyotangia emarginata* (Uhl.), tegmen.
17. *Dictyotangia emarginata* (Uhl)., wing.
18. *Dioxyomus ganymedes*, n.sp., tegmen.
19. *Dioxyomus ganymedes*, n.sp., wing.
20. *Aripoa silvana*, n.sp., membrane of tegmen and apical margin.
21. *Alcestis lunata*, n.sp., head and thorax.
22. *Alcestis lunata*, n.sp., head, antero-ventral view.
23. *Alcestis lunata*, n.sp., anterior margin of tegmen.
24. *Neurotmeta dominicana*, n.sp., aedeagus, ventral view.
25. *Neurotmeta dominicana*, n.sp., aedeagus, right side.
26. *Neurotmeta bipatriata*, n.sp., ventral spines of aedeagus, ventral view.
27. *Neurotmeta bipatriata*, n.sp., aedeagus, right side.
28. *Neurotmeta oreas*, n.sp., ventral spines of aedeagus, ventral view.
29. *Neurotmeta oreas*, n.sp., aedeagus, right side.
30. *Neurotmeta litoralis*, n.sp., aedeagus, ventral view.
31. *Neurotmeta litoralis*, n.sp., aedeagus, right side.
32. *Neurotmeta dominicana*, n.sp., posterior margin of pygofer and left genital style.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33. *Neurotmeta dominicana*, n.sp., anal segment of male.
34. *Tangidia alternata* Uhl., posterior margin of pygofer and anal segment.
35. *Tangidia alternata* Uhl., left genital style.
36. *Tangidia alternata* Uhl., periandrium, left side.
37. *Tangidia alternata* Uhl., penis, left side.
38. *Tangidia alternata* Uhl., opercular ornamentation on egg, side view.
39. *Tangidia fugax*, n.sp., periandrium, left side.
40. *Tangidia fugax*, n.sp., penis, left side.
41. *Dictyotangia emarginata* (Uhl.), aedeagus, left side.
42. *Dictyotangia emarginata* (Uhl.), left genital style.
43. *Remosa kontorhina*, n. sp., aedeagus, right side.
44. *Remosa kontorhina*, n.sp., aedeagus, ventral view.
45. *Remosa cultellator* (Walker), aedeagus, ventral view.
46. *Remosa cultellator* (Walker), aedeagus, right side.
47. *Remosa cultellator* (Walker), right genital style.
48. *Neotangia caribea*, n.sp., flagellar process of aedeagus, dorsal view.
49. *Neotangia caribea*, n.sp., aedeagus, right side.
50. *Neotangia angustata* (Uhl.), aedeagus, right side.
51. *Neotangia mitrata*, n.sp., flagellar process of aedeagus, dorsal view.
52. *Neotangia angustata* (Uhl.), flagellar process of aedeagus, dorsal view.
53. *Chasmacephala tristis*, n.sp., opercular ornamentation of egg, anterior view.
54. *Chasmacephala tristis*, n.sp., opercular ornamentation of egg, side view.
55. *Chasmacephala furtiva*, n.sp., penis, right side.
56. *Chasmacephala furtiva*, n.sp., right genital style.
57. *Chasmacephala furtiva*, n.sp., periandrium, right side.
58. *Chasmacephala pluvialis*, n.sp., right genital style.
59. *Chasmacephala pluvialis*, n.sp., aedeagus, right side.
60. *Chasmacephala tristis*, n.sp., periandrium, right side.
61. *Chasmacephala tristis*, n.sp., penis, right side.
62. *Dioxyomus uhleri* (Muir), pygofer, anal segment, aedeagus and genital style, left side. (From drawing made by W. E. China from type.)
63. *Dictyotangia emarginata* (Uhl.), opercular ornamentation of egg, anterior view.
64. *Dictyotangia emarginata* (Uhl.), as above, side view.
65. *Neotangia coronata*, n.sp., opercular ornamentation of egg, anterior view.
66. *Neotangia coronata*, n.sp., as above, side view.
67. *Neotangia mitrata*, n.sp., opercular ornamentation of egg, anterior view.
68. *Neotangia mitrata*, n.sp., as above, side view.
69. *Neotangia angustata* (Uhl.), opercular ornamentation of egg, anterior view.
70. *Neotangia angustata* (Uhl.), as above, side view.
71. *Remosa kontorhina*, n.sp., opercular ornamentation of egg, anterior view.
72. *Remosa kontorhina*, n.sp., as above, side view.
73. *Dioxyomus major*, n.sp., opercular ornamentation of egg, anterior view.
74. *Dioxyomus major*, n.sp., as above, side view.
75. *Dioxyomus ganymedes*, n.sp., opercular ornamentation of egg, side view.
76. *Aripoa silvana*, n.sp., opercular ornamentation of egg, anterior view.
77. *Aripoa silvana*, n.sp., as above, side view.